

Abstract

The present invention provides transition-metal-catalyst-based methods for the arylation and vinylation of activated methyl, methylene, and methine carbons with aryl halides, vinyl halides, and the like. The methods of the invention provide several improvements over existing methods, including the ability to synthesize efficiently and under mild conditions α -aryl and α -vinyl products from a wide range of starting materials, including ketones, esters, hydrazones, and imines. Furthermore, the methods of the invention may be used in an asymmetric sense, i.e. to produce enantiomerically-enriched chiral α -aryl and α -vinyl products.